APPENDIX B

RESPONSE ACTION GUIDANCE

POTENTIAL HAZARDOUS CHEMICALS

Potential hazardous chemicals used at Florence Copper, and their reporting quantities (RQ):

LIQUIDS

ACORGA M5774 Solvent Ext Reagent – (SARA 313 Reporting - Phenol, 4-nonyl-, branched) – Tote, Extractant tanks RQ = 16 lbs / 2.2 gallons

Chlorine 12.5% - 55 gallon barrels[1] – RQ =100 lbs / 10 gallons

Copper Raffinate Solution – No RQ established

Copper Pregnant Leach Solution – No RQ established

Copper Electrolyte Solution – No RQ established

High Point 90 (SARA 313 Reporting - Dimethyl Phthalate) – 1400 gallons

Orfom® SX-11 (Solvent Extraction Diluent) No RQ

Petroleum products, used oil – RQ = 25 gallons

Sulfuric Acid 93% (SARA 313 reporting) – Tank – RQ=1,000 lbs / 65 gallons

Transformer fluids (non-PCB), mineral oil, dielectric fluid – R Q = 25 gallons

SOLIDS

Calcium Hydroxide (Hydrated Lime) – 9-10 supersacks – No RQ

Cobalt Sulfate 33%, granular – R Q = 3030 lbs.

Constant Chlor Plus Chlorine Briquettes – 50-lb bucket – RQ = 12.5 lbs.

OTHER

Hazardous Waste – See specific waste for RQ

Always refer to the product Safety Data Sheet (SDS) located on the share drive or in the binder in the Process Test Facility Control Room for specific handling procedures and possible hazards.

[1] Rarely stored on site

Subject: **ACORGA** ®M5774 Solvent Extraction Reagent

LOCATION: PTF **TYPICAL VOLUME ON SITE:** ±5700 gallons

RESPONSE ACTION GUIDANCE

ACORGA ®M5774 - **Mixed Molecular Formula**

5-Nonyl-2-hydroxy-benzaldoxime, 30-60%	CAS 174333-47-8
Petroleum distillate hydrotreated light, 7-13%	CAS 64742-47-8
Phenol, 4-nonyl-, branched, 0.05-1.1%	CAS 84852-15-3

Physical/Chemical Properties

Causes eye and skin irritation

Description	Liquid	**Flash Point**	239°F
Odor	None	**Boiling Point**	N.A.
Color	Clear amber	**pH**	N.A.
Solubility	Insoluble	**Freezing Point**	N.A.
Density		**Specific Gravity**	0.96-0.98@25°C
Reportable Quantity	16 lbs.	7.31 lbs/gal	2.2 gallons

Storage Area: SX/EW building 2nd floor electro winning tanks and in totes on the first floor.

Overview

ACORGA ®M5774 is a chemical extractant reagent used in the copper extraction electrowinning process at the Process Test Facility.

Hazards

For specific health and other hazards and precautions refer to a Safety Data Sheet for product from which the waste was generated.

GENERAL PRECAUTIONS FOR SAFE HANDLING

- Be sure area is well ventilated

NFPA Rating

Health	Flammability	Reactivity	Other
2	1	0	

Special Safety Equipment Recommended

- Chemical Splash-proof goggles or face shield
- Impermeable Gloves
- Protective clothing

Accidental Release Response

CONSIDER ACTIONS ONLY IF SAFETY PERMITS

- In addition to PPE listed above, wear impermeable boots
- Contain liquid if possible
- Cover with inert absorbent material
- Sweep up absorbent material and place in an appropriate waste disposal container
- Flush affected area with water

Subject: **Calcium Hydroxide** (Hydrated Lime) (**$Ca(OH)_2$**)

LOCATION: East Warehouse, PTF **TYPICAL VOLUME ON SITE:** 9-10 Totes

RESPONSE ACTION GUIDANCE

Calcium Hydroxide ($Ca(OH)_2$)			**CAS 1305-62-0**
Physical/Chemical Properties			
Caustic material – can cause severe irritation of eyes, skin, respiratory tract (if inhaled), and gastrointestinal tract (if swallowed)			
Description	Solid powder	**Flash Point**	Not applicable
Odor	Odorless	**Boiling Point**	Decomposes
Color	White	**pH**	12.44
Solubility	Relatively insoluble	**Freezing Point**	N.A.
Relative Density	0.4-0.7 g/cm^3	**Specific Gravity**	2.24
Reportable Quantity	Not listed		

Overview

Calcium Hydroxide, a.k.a Hydrated Lime is a non-combustible solid used in the Process Test Facility to neutralize process water. This product is shipped and stored in totes.

Hazards

For specific health and other hazards and precautions refer to a Safety Data Sheet for product from which the waste was generated.

GENERAL PRECAUTIONS FOR SAFE HANDLING

Calcium Hydroxide is considered an irritant. It is corrosive to eyes, and will cause skin irritation, respiratory irritation (if inhaled), and gastrointestinal irritation (if ingested). (Refer to Safety Data Sheet for specific health and other hazards and precautions.) Wear appropriate PPE to avoid exposure, and use outdoors or in a well-ventilated area.

NFPA Rating

Health	Flammability	Reactivity	Other
2	0	0	

Special Safety Equipment Recommended

- Protective goggles
- Protective gloves
- Dust mask

Accidental Release Response

CONSIDER ACTIONS ONLY IF SAFETY PERMITS

Small accidental releases:

- Avoid generating dust.
- Use dry methods to collect released material.
- Store collected material in dry, sealed plastic or metal containers.
- Residue on surfaces may be washed with water or dilute vinegar.

Large accidental release:

- Evacuate area downwind of release site to minimize dust exposure.
- Use dry methods to collect released material.
- Store collected material in dry, sealed plastic or metal containers.
- Residue on surfaces may be washed with water or dilute vinegar.

Subject: **Chlorine, 12.5%** (Sodium Hypochlorite Solution) (NaOCl)

LOCATION: East Warehouse, Wellfield **TYPICAL VOLUME ON SITE:** 0-110 gallons

RESPONSE ACTION GUIDANCE

Sodium Hypochlorite Solution (NaOCl)		**(UN 1830 CAS 7681-52-9)**	
Physical/Chemical Properties			
Do not mix acids, ammonia, or other organic or inorganic chemicals with this product.			
Description	Alkaline liquid	**Flash Point**	Not appllicable
Odor	Slight Bleach	**Boiling Point**	Decomposes
Color	Straw Yellow	**pH**	11.2 - 11.4
Solubility	Soluble in water	**Freezing Point**	-20°F
Bulk Density	NA	**Specific Gravity**	1.2 @ 68°F
Reportable Quantity 100% Soln	100 lbs.	@10.0 lb/gal =	80 gallons 12.5% Soln

Overview:

Sodium Hypochlorite solution in bulk is used in the wellfield for well development and rehabilitation. Smaller, more dilute quantities are used for household cleaning. This substance is classified as an irritant by the OSHA.

Hazards:

Sodium Hypochlorite is extremely caustic. Care should be taken to avoid contact with skin and eyes. For specific health and other hazards and precautions refer to a Safety Data Sheet for this product.

GENERAL PRECAUTIONS FOR SAFE HANDLING

Open containers Carefully. Mix only with water.

NFPA Rating

Health	Flammability	Reactivity	Other
2	0	0	

Special Safety Equipment Recommended:

- Chemical goggles or face shield
- Chemical-resistant, rubber gloves

Accidental Release Response:

CONSIDER ACTIONS ONLY IF SAFETY PERMITS

Small release:

- Flush area with water, or
- Absorb liquid with sand and dispose in accordance with applicable Federal regulations.
- In necessary, neutralize the residue with a dilute solution of lime or other suitable neutralizing agent.

Large release outside of containment:

- Restrict access to release site
- Stop the discharge at its source, if possible
- If discharge is in containment, material should be transferred into an appropriate container for reuse
- If discharge has escaped containment, flush the area with large amounts of water.
- Prevent entry into sewers or waterways until material has been suitably diluted.
- Dispose of waste material at an approved waste treatment/disposal facility.

Subject: **Cobalt Sulfate 33%** **($CoSO_4 \cdot H_2O$)**

LOCATION: Solids: East Warehouse, labs

Solution: RTF building, 2nd floor, west side **TYPICAL VOLUME ON SITE:** TBD

RESPONSE ACTION GUIDANCE

Cobalt Sulfate Monohydrate 33% ($CoSO_4 \cdot H_2O$)			**CAS 10124-43-3**
Physical/Chemical Properties			
Harmful if swallowed or inhaled			
Description	Solid crystals	**Flash Point**	Not applicable
Odor	Odorless	**Boiling Point**	1355°
Color	Pink to red transparent crystals	**pH**	No data
Solubility	@ 37F 60.4 g/100 ml	**Freezing Point**	N.A.
Relative Density	0.4-0.7 g/cm^3	**Specific Gravity**	No data
Reportable Quantity 100% Soln	1000 lbs	**RQ for 33% Soln**	3030 lbs

Overview:

Cobalt Sulfate is a non-combustible solid used in the electrowinning process at the Process Test Facility to enhance cathode copper quality.

Hazards:

For specific health and other hazards and precautions refer to a Safety Data Sheet for this product.

GENERAL PRECAUTIONS FOR SAFE HANDLING

Cobalt Sulfate is harmful if inhaled or if ingested. (Refer to Safety Data Sheet for specific health and other hazards and precautions.) Wear appropriate PPE to avoid exposure, and use in a well-ventilated area.

NFPA Rating

Health	Flammability	Reactivity	Other
2	0	0	

Special Safety Equipment Recommended:

- Chemical safety goggles where dusting or splashing of solutions is possible
- Protective gloves
- Clean, body-covering clothing

Accidental Release Response:

CONSIDER ACTIONS ONLY IF SAFETY PERMITS

- Ensure Adequate Ventilation.
- Wear appropriate PPE.
- Sweep up and containerize for re-use or disposal.
- Vacuuming or wet sweeping may be used to avoid dust dispersal.
- Dispose of waste material following appropriate local and federal guidelines.

Subject: **Constant Chlor Plus Chlorine Briquettes**

LOCATION: PTF, Potable Water Building **TYPICAL VOLUME ON SITE:** 100 lbs. (2 ea. 50 lb buckets)

RESPONSE ACTION GUIDANCE

Constant Chlor Plus Briquettes ($CaClO_2$) 60-80% CAS: 7778-54-3			
Physical/Chemical Properties			
Corrosive			
Description	Solid tablets	**Flash Point**	NA
Odor	Chlorine-like	**Boiling Point**	NA
Color	White	**pH**	10.4 – 10.8
Solubility	Soluble in water	**Freezing Point**	NA
Density	1.9g/cc	**Molecular Weight**	143 g/mol
Reportable Quantity	13 lbs		

Overview:

Constant Chlor Plus Briquettes are used in the potable water systems at the PTF and at the Potable water building. Typically one 50-lb bucket is stored at each area.

Hazards:

For specific health and other hazards and precautions refer to a Safety Data Sheet for this product.

GENERAL PRECAUTIONS FOR SAFE HANDLING

Avoid inhalation of dust and fumes. Avoid contact with eyes, skin and clothing. (Refer to Safety Data Sheet for specific health and other hazards and precautions.) Wear appropriate PPE to avoid exposure, and use in a well-ventilated area.

NFPA Rating

Health	Flammability	Reactivity	Other
2	0	0	

Special Safety Equipment Recommended:

- Chemical safety goggles where dusting or splashing of solutions is possible
- Protective gloves
- If exposure is possible to a large portion of the body wear a full impervious suit

Accidental Release Response:

CONSIDER ACTIONS ONLY IF SAFETY PERMITS

Air Release –

Suppress vapors with water fog

Water Release –

- Material is soluble in water. Dike area to prevent spread of liquid.
- Monitor for available chlorine and pH
- Ensure Adequate Ventilation.
- Wear appropriate PPE.

Land Release –

- If release quantity ≥100 lbs or when dust exposure is possible
- Keep material away from any combustible material
- Using a clean broom or shovel Place all recovered product into plastic bags
    - Place those bags into a clean dry disposal container, properly marked and labeled
        - Do not seal containers tightly
        - Move disposal containers to an isolated area outdoors
- Dispose of waste material following appropriate local and federal guidelines

Subject: **Copper Raffinate**

LOCATION: PTF tank farm, injection pipeline **TYPICAL VOLUME ON SITE:** 31074 gal in tank plus liquid in pipeline

RESPONSE ACTION GUIDANCE

			32389
Raffinate (Depleted Pregnant Leach Solution) CAS: NA			
Physical/Chemical Properties			
Corrosive			
Description	Liquid	**Flash Point**	NA
Odor	Odorless	**Boiling Point**	Not available
Color	Clear to brownish	**pH**	1.4
Solubility	soluble	**Freezing Point**	Not available
Relative Density	Not available	**Specific Gravity**	1.0-1.035
Reportable Quantity	Not listed		

Overview:

Raffinate is the copper depleted byproduct of the solution extraction/electrowinning process. The raffinate is recycled by collecting the liquid in tanks at the SX/EW plant, adjusting the acidity of the solution, and re-injecting the fluid into the wellfield.

Hazards:

For specific health and other hazards and precautions refer to the Safety Data Sheet for Copper Raffinate.

GENERAL PRECAUTIONS FOR SAFE HANDLING

Special Safety Equipment Recommended:

- Chemical safety goggles where dusting or splashing of solutions is possible
- Protective gloves

Accidental Release Response:

CONSIDER ACTIONS ONLY IF SAFETY PERMITS

- Prevent liquids from entering drains.
- Dike area to prevent further flow.
- Neutralize with lime slurry solution.
- Dispose of waste material following appropriate local and federal guidelines.

Subject: **Pregnant Leach Solution (PLS)**

LOCATION: PTF tank farm, recovery pipeline **TYPICAL VOLUME ON SITE:** 31074 gal in tank plus liquid in pipeline

RESPONSE ACTION GUIDANCE

Pregnant Leach Solution CAS: NA			
Physical/Chemical Properties			
Corrosive			
Description	Liquid	**Flash Point**	NA
Odor	Odorless, metallic	**Boiling Point**	Not available
Color	Blue-green-brown	**pH**	~2
Solubility	Soluble in water	**Freezing Point**	Not available
Relative Density	Not available	**Specific Gravity**	1.0-1.05
Reportable Quantity	Not listed		

Overview:

PLS is the copper rich byproduct of the solution extraction process. The PLS is processed into copper in the SX/EW plant.

Hazards:

Skin irritation, may cause eye burns. Harmful if inhaled or swallowed. For specific health and other hazards and precautions refer to the Safety Data Sheet for Pregnant Leach Solution.

GENERAL PRECAUTIONS FOR SAFE HANDLING

Special Safety Equipment Recommended:

- Chemical safety goggles where dusting or splashing of solutions is possible
- Protective gloves
- Well-ventilated area

Accidental Release Response:

CONSIDER ACTIONS ONLY IF SAFETY PERMITS

- Prevent liquid from entering drains and waterways.
- Dike area to prevent further flow.
- Neutralize with lime slurry solution.
- Dispose of waste material following appropriate local and federal guidelines.

Subject: **Copper Electrolyte Solution**

LOCATION: SX/EW **TYPICAL VOLUME ON SITE: T.B.D.**

RESPONSE ACTION GUIDANCE

Copper Electrolyte Solution CAS: NA			
Physical/Chemical Properties			
Corrosive			
Description	Liquid	**Flash Point**	NA
Odor	Odorless	**Boiling Point**	Not available
Color	Blue-green-brown	**pH**	< 1
Solubility	soluble	**Freezing Point**	Not available
Relative Density	Not available	**Specific Gravity**	Not Available
Reportable Quantity	Not listed		

Overview:

Copper electrolyte solution is the concentrated copper byproduct of the solution extraction/electrowinning process. The electrolyte solution is processed into copper plates in the electrowinning process.

Hazards:

Corrosive

For specific health and other hazards and precautions refer to a Safety Data Sheet for product from which the waste was generated.

GENERAL PRECAUTIONS FOR SAFE HANDLING

Special Safety Equipment Recommended:

- Chemical safety goggles where dusting or splashing of solutions is possible
- Protective gloves

Accidental Release Response:

CONSIDER ACTIONS ONLY IF SAFETY PERMITS

- Prevent liquid from entering drains.
- Dike area to prevent further flow.
- Neutralize with lime slurry solution.
- Dispose of waste material following appropriate local and federal guidelines.

Subject: **Hazardous Waste**

LOCATION: Hazardous Waste Accumulation Area **TYPICAL VOLUME ON SITE: Currently 0**

RESPONSE ACTION GUIDANCE

Overview:

The PTF has been designed to produce very little waste. However, from time to time, hazardous waste may originate from various sources at the facility. Items that have been identified and designated as hazardous waste are labeled accordingly.

Hazards:

For specific health and other hazards and precautions refer to a Safety Data Sheet for product from which the waste was generated.

Special Safety Equipment Recommended:

- Dependent on the hazards associated with a given waste – refer to an appropriate SDS as described above.

Response:

- Restrict access to the release area.
- Stop the release at its source if possible.
- Contain the release as close to the source as safe and practical.
- For liquid hazardous wastes recover as much of the liquid as possible into tighthead drums meeting DOT specifications for the material; soak up the remainder using absorbent material and place this into open top drums meeting DOT specifications for the material, and secure with lids.
- For solid hazardous wastes recover the material into open top drums meeting DOT specifications for the material and secure with lids.
- Obtain approximately 1-quart sample of the released material.

Response Action Guidance

Hi Point 90 (Methyl Ethyl Ketone Peroxides)			
Methyl Ethyl Ketone Peroxide	36-40%	CAS	1338-23-2
Dimethyl phthalate	32-36%	CAS	131-11-3
Proprietary safety diluent	26-30%	CAS	NA
Physical/Chemical Properties			
Aspiration Hazard			
Description	Liquid	**Flash Point**	237°F
Odor	Mild	**Boiling Point**	418-601°F
Color	Colorless	**pH**	7
Solubility	Negligible	**Vapor Density**	1
Relative Density	0.81 @ 60°F	**Freezing Point**	
		Specific Gravity	1.19*
Reportable Quantity-Dimethyl Phthalate*	5000 lb	36%	`1400 gallons

* SG 1.19, 9.931 lb/gal

Overview: Hi Point 90 (Methyl Ethyl Ketone Peroxides)
Response Action Component: Dimethyl Phthalate 32 – 36 %

Hazards: May be harmful or fatal if swallowed. May cause allergic skin reaction. May be irritating or corrosive to skin and/or eyes. Combustible liquid, oxidizing material.

NFPA Rating

Health	Flammability	Reactivity	Other
3	2	2	-

Special Safety Equipment Recommended:

- DO NOT WEAR CONTACT LENSES.
- Neoprene type gloves.
- Suitable eye protection which may consist of face shield or mono-goggles.
- Wear protective clothing
- Apron/boots of neoprene if risk of splashing.

Response:

- Ensure good ventilation.
- Stop the release at its source if possible.
- If discharge is in containment, material should be recycled back through the process.
- If discharge has escaped containment, or if the discharge occurred elsewhere, contain the release in the smallest area possible using berms of dry soil, sand or other non-combustible inert material.
- Cover with foam or wet with small quantities of water.
- Sweep up using non-sparking equipment.
- Collect in a suitable container for disposal.
- Dispose of waste material in compliance with all federal, state, and local regulations

Subject: **Orfom® SX-12 (Solvent Extraction Diluent)**

LOCATION: PTF **TYPICAL VOLUME ON SITE:** ±3817 gal

RESPONSE ACTION GUIDANCE

Orfom® SX-11 (Solvent Extraction Diluent) C13-C16 Isoalkanes 99-100% CAS 68551-20-2			
Physical/Chemical Properties			
Aspiration Hazard			
Description	Liquid	**Flash Point**	213°F
Odor	Mild	**Boiling Point**	417-601°F
Color	Colorless	**pH**	7
Solubility	Negligible	**Vapor Density**	
Relative Density	0.79 @ 60°F	**Freezing Point**	
Reportable Quantity	Not listed		

Overview:

Orfom® SX-11 is a petroleum distillate used at the Process Test Facility for metal solvent extraction.

Hazards:

For specific health and other hazards and precautions refer to a Safety Data Sheet for product from which the waste was generated.

GENERAL PRECAUTIONS FOR SAFE HANDLING

The PTF has implemented engineering methods to control airborne concentrations of Orfom® SX-11. General precautions for handling and exposure to any chemical should be followed.

NFPA Rating

Health	Flammability	Reactivity	Other
1	1	0	

Special Safety Equipment Recommended

When handling liquid:

- Protective goggles if handling liquid
- Protective gloves
- Protective suit

Accidental Release Response:

CONSIDER ACTIONS ONLY IF SAFETY PERMITS

- Ensure Adequate Ventilation.
- Do not breathe vapors or dust.
- Wear appropriate PPE.
- Contain the liquid and remove to a suitable container for re-use or disposal.
- Soak up any remaining liquid with inert absorbent material such as sand.
- Place used absorbent material in suitable, closed containers for disposal.

Subject: **Petroleum Products and Used Oil**

LOCATION: Firewater skid at the PTF (tank),
Satellite collection PTF, haz waste disposal area **TYPICAL VOLUME ON SITE:** ~500 gallons diesel

Response Action Guidance

Diesel Fuel		**CAS 68476-34-6**	
Physical/Chemical Properties			
Flammable			
Description	Liquid	**Flash Point**	>125°F
Odor	Mild, petroleum distillate odor	**Boiling Point**	320-700°F
Color	Clear, straw yellow	**pH**	ND
Solubility	Negligible	**Freezing Point**	NA
Relative Density	(Vapor) > 1.0	**Specific Gravity**	0.82-0.88
Reportable Quantity	25 gallons		

Gasoline		**CAS 86290-81-5**	
Physical/Chemical Properties			
Flammable			
Description	Liquid	**Flash Point**	-45°F
Odor	Strong, sweet-ether like	**Boiling Point**	85-437°F
Color	Translucent, straw-colored or lt. yellow	**pH**	ND
Solubility	Negligible to slight	**Freezing Point**	ND
Relative Density		**Specific Gravity**	0.70-0.78
Reportable Quantity	25 gallons		

Overview:

Petroleum products are used as fuel, for lubrication purposes, and in the solution extraction/electro-winning process. Used oil is generated from the lubrication requirements associated with surface equipment and some pumps. Florence Copper has one double-lined, 500-gallon diesel fuel tank to fuel the emergency generator for the fire water pump at the PTF. Uncontaminated used oil is collected in a 35 – drum which is labeled and stored on a secondary containment pallet at the PTF, and in the hazardous waste accumulation area. Florence Copper automobiles are fueled off site; aside from small gas cans (1 – 5 gallons) there is no gasoline containment in the plant area.

Hazards:

Fire and explosion are potential hazards for personnel responding to releases of gasoline, diesel fuel, or oil products. Refer to a Safety Data Sheet for the item in question for specific health and other hazard precautions.

NFPA Rating

	Health	Flammability	Reactivity
#1 or #2 Diesel	0	2	0
Lube, Hydraulic, Used Oil	0	1	0
Gasoline	1	3	0

Special Safety Equipment Recommended:

- Chemical goggles, full face shield
- Impervious gloves, boots, and whole body protection
- Organic respirators if mists are present and exceed concentration exposure limits
- Self-contained breathing apparatus (SCBA) for incidents involving fire

Response:

- Restrict access to the release site and evacuate area, if necessary.
- Ensure that potential ignition sources are kept away from the area.
- Stop the discharge at its source.
- If the release is confined to a tank containment basin, recover the liquid into a suitable container.
- If the release has escaped a containment basin, contain the liquid in the smallest area possible using berms of soil and then recover the liquid material into a suitable container.
- For small releases (≤55 gallons), contain and absorb using absorbent material available at the PTF. Squeeze excess oil out of rags into used oil container and dispose of rags in appropriate container. Used absorbent material should be placed into a barrel for disposal. Soils that have come into contact with the petroleum product should be removed and stored in appropriate containment.
- For large releases, pump out as much of the material as possible into a used oil container. Use absorbent material to collect remainder. Remove any contaminated soil and place in the appropriate barrel for disposal.

Subject: **Sulfuric Acid, 93%** (H_2SO_4)

LOCATION: Process Test Facility Tank;
Dilute solution in pipelines, raffinate, PLS **Typical volume on site:** 10420 gal (max)

RESPONSE ACTION GUIDANCE

SULFURIC ACID (H_2SO_4) (UN 1830 CAS 7664-93-9)			
Physical/Chemical Properties			
Danger! Highly corrosive, toxic liquid that reacts with many chemicals and metals.			
Description	Acid liquid	**Flash Point**	Not flammable/combustible
Odor	Acrid odor	**Boiling Point**	276 to 330°C
Color	Colorless, oily	**Freezing Point**	-11°C
Solubility	Soluble in water	**pH**	<1
Vapour Density	Heavier than air (3.4)	**Specific Gravity**	Sinks in water (1.67 to 1.84)
Reportable Quantity	1000 lbs.	@15.37 lb/gal =	65 gallons

Overview:

EXTREMELY HAZARDOUS MATERIAL

Sulfuric Acid is used in the in-situ process at Florence Copper to leach copper within the oxide ore body. Full-strength sulfuric acid (93%) is stored in a tank at the Production Test Facility and is diluted for in-situ injection. This dilute solution is transported via pipeline to the injection wells. The pipelines and wellheads are located in lined trenches.

Hazards:

Full strength sulfuric acid is EXTREMELY CORROSIVE. Causes severe burns and / or eye damage. Harmful or fatal if swallowed. Reacts violently with water. Harmful if inhaled. Mist: Causes respiratory irritation. (Refer to Safety Data Sheet for specific health and other hazards and precautions.)

NFPA Rating

Health	Flammability	Reactivity	Other
3	0	2	ACID

Special Safety Equipment Recommended:

- Chemical goggles and face shield
- Acid resistant aprons or suits with trouser legs outside (not tucked in) rubber boots
- Chemical-resistant, impervious gloves
- Respirator based on known or anticipated exposure levels

Accidental Release Response

CONSIDER ACTIONS ONLY IF SAFETY PERMITS

Small accidental release:

- Cover with DRY earth, sand or other non-combustible material or absorb with an inert dry material.
- Place in a loosely covered plastic waste disposal container
- In necessary, neutralize the residue with a dilute solution of lime or other suitable neutralizing agent.

Large accidental release Outside of Containment:

- Restrict access to release site
- Stop the discharge at its source, if possible
- If discharge is in containment, material should be recycled back through the process
- If discharge has escaped containment, or if the discharge occurred elsewhere, contain the release in the smallest area possible using berms of dry soil, sand or other non-combustible inert material.
- Prevent entry into sewers or waterways.
- Neutralize with lime or other suitable neutralizing agent.
- Ensure adequate decontamination of tools and other equipment following clean up.
- Obtain approximately 1-quart sample of the released or neutralized material.
- Dispose of waste material at an approved waste treatment/disposal facility

Neutralization Reactions:

DO NOT RANDOMLY ADD WATER TO STRONG ACID! May cause explosion. Neutralize with water and lime under supervision of Response Coordinator to create calcium sulfate and water.

$H_2SO_4 + Ca(OH)_2 \Rightarrow CaSO_4 + 2\ H_2O$

Subject: **Transformer Fluids**

LOCATION: PTF & Wellfield Transformers (mineral oil); **Typical volume:** 500-550 gallons/transformer
BHP tank farm & behind main office (Dielectric); **Typical volume:** 500-500 gallons/transformer

Response Action Guidance

Mineral Oil		**CAS 8012-95-1**	
Physical/Chemical Properties			
Flammable			
Description	Clear liquid	**Flash Point**	275°F
Odor	NA	**Boiling Point**	424.4 – 1189.4°F
Color	Colorless	**pH**	NA
Solubility	Insoluble in water	**Freezing Point**	NA
Relative Density	NA	**Specific Gravity**	0.906 – 0.914
Reportable Quantity	25 gallons		

Dielectric Fluid (non-PCB)		**CAS unknown**	
Physical/Chemical Properties			
Flammable			
Description	Viscous Liquid	**Flash Point**	NA
Odor	Odorless	**Boiling Point**	NA
Color	Translucent, Straw-colored or clear	**pH**	NA
Solubility	Very Low	**Freezing Point**	NA
Vapor Density	NA	**Specific Gravity**	NA
Reportable Quantity	25 gallons		

Overview:

The transformers at Florence Copper are classified as non-PCB. These transformers use either mineral oil or silicone dielectric fluid.

Hazards:

Avoid breathing mists. Refer to a Safety Data Sheet for the fluid in question for specific health and other hazards and precautions

NFPA Rating (Mineral Oil)

Health	Flammability	Reactivity	Other
0	1	0	0

Special Safety Equipment Recommended:

- Eye/face protection
- Impervious gloves, and impervious clothing if body is exposed
- Organic respirators if mists are present and exceed concentration exposure limits
- Self-contained breathing apparatus (SCBA) for incidents involving fire

Response:

- Restrict access to the release site.
- If the release is confined to a containment basin, recover as much liquid as possible into tighthead steel drums meeting DOE Specification UN1A1/X1.8/300; soak up the remainder using absorbent material and place this into open top steel drums meeting DOT specification UN1A2/X426/S and secure with lids.
- If the transformer does not have a containment basin, contain the liquid using berms of soil or absorbent materials. Recover as much liquid as possible into tighthead steel drums meeting DOE Specification UN1A1/X1.8/300; soak up the remainder using absorbent material and place this into open top steel drums meeting DOT specification UN1A2/X426/S and secure with lids.
- Obtain approximately ½ pint sample of the fluid for analysis.